

What is claimed is:

1 1. A remote controlled garage door opening and closing system,
2 comprising:

3 a mechanism operably connected to a garage door to open or close
4 said door in response to a command signal;

5 a plurality of transmitters operably generating respective
6 changeable hopping code signals, each hopping code signal comprising an
7 encrypted first synchronization value;

8 a receiver for intercepting said changeable hopping code signals;
9 first means within said receiver for operably generating unique
10 multibit secret keys respectively identifiably associated with said plurality
11 of transmitters; and

12 second means within said receiver (i) for performing a non-linear
13 decoding function on an intercepted changeable hopping code signal using
14 one of said multibit secret keys, thereby to generate a second
15 synchronization value (ii) for comparing said second synchronization value
16 with said first synchronization value and generating said command signal
17 when said second synchronization value bears a predetermined matching
18 relationship with said first synchronization value (iii) in the absence of
19 said predetermined matching relationship, for performing another non-
20 linear decoding function on said intercepted signal using a different one
21 of said multibit secret keys to generate another second synchronization
22 value, and (iv) for continually repeating the sequence until a second
23 synchronization value is found which bears the said predetermined
24 matching relationship with said first synchronization value.

1 2. The system as recited in Claim 1, wherein said first
2 synchronization value increments every time its associated transmitter is activated.

1 3. The system as defined by Claim 1, wherein said plurality of
2 transmitters have associated therewith multibit secret keys respectively
3 corresponding to, but being separate from, the multibit secret keys associated with
4 the receiver.

1 4. A remote controlled garage door opening and closing system,
2 comprising:

3 a mechanism operably connected to a garage door to open or close
4 said door in response to a command signal;

5 a plurality of transmitters operably generating respective
6 changeable hopping code signals, each hopping code signal comprising an
7 encrypted first synchronization value;

8 a receiver for intercepting said changeable hopping code signals;

9 first means within said receiver for operably generating unique
10 multibit secret keys respectively identifiably associated with said plurality
11 of transmitters;

12 second means within said receiver (i) for performing a non-linear
13 decoding function on an intercepted changeable hopping code signal using
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18 relationship with said first synchronization value (iii) in the absence of
19 said predetermined matching relationship, for performing another non-
20 linear decoding function on said intercepted signal using a different one
21 of said multibit secret keys to generate another second synchronization
22 value, and (iv) for continually repeating the sequence until a second
23 synchronization value is found which bears the said predetermined
24 matching relationship with said first synchronization value;

25 a microprocessor associated with said receiver; and

26 third means for controlling the mode of operation of said
27 microprocessor between a learn mode and an operate mode, said third means
28 being operable to place said microprocessor in a learn mode for a
29 predetermined length of time and automatically returning said
30 microprocessor to the operate mode at the end of said time.

1 5. A remote controlled garage door opening and closing system,
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7 encrypted first synchronization value;

8 a receiver for intercepting said changeable hopping code signals;

9 first means within said receiver for operably generating unique
10 multibit secret keys respectively identifiably associated with said plurality
11 of transmitters;

12 second means within said receiver (i) for performing a non-linear
13 decoding function on an intercepted changeable hopping code signal using
14 one of said multibit secret keys, thereby to generate a second
15 synchronization value (ii) for comparing said second synchronization value
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17 when said second synchronization value bears a predetermined matching
18 relationship with said first synchronization value (iii) in the absence of
19 said predetermined matching relationship, for performing another non-
20 linear decoding function on said intercepted signal using a different one
21 of said multibit secret keys to generate another second synchronization
22 value, and (iv) for continually repeating the sequence until a second
23 synchronization value is found which bears the said predetermined
24 matching relationship with said first synchronization value;

25 memory means within said receiver; and

26 third means within said receiver for automatically and randomly
27 storing said multibit secret keys in said memory means without user
28 intervention.
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